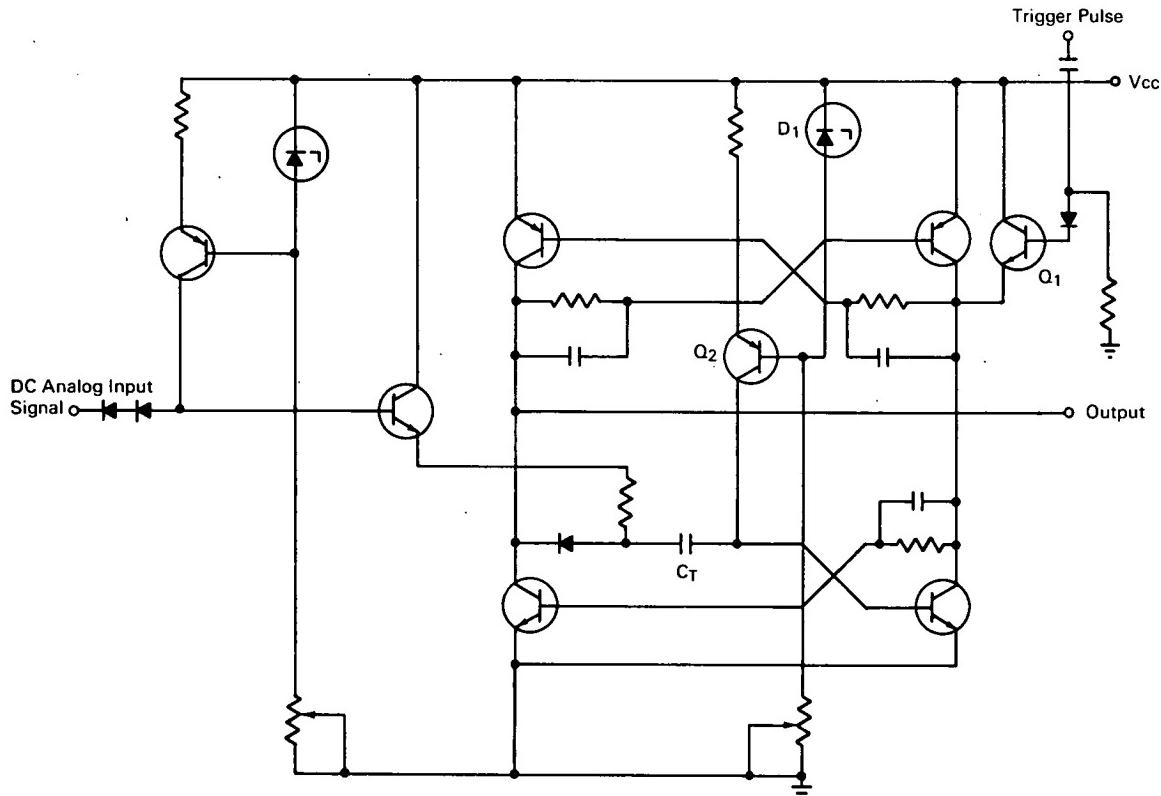


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151..

Linear Analog DC Voltage-to-Pulse-Width Converter



This circuit converts a dc analog input signal (0 to 5 volts) to pulse widths that are proportional to the input signal voltage. The circuit represents an improvement over previous pulse-width converters with regard to design simplicity, efficiency, linearity, accuracy, and temperature stability.

The converter consists of a complementary monostable flip-flop controlled by the constant-current discharge of the temperature compensated capacitor C_T. This capacitor is charged by the analog input

signal. A trigger pulse through Q₁ initiates a linear discharge of C_T through the constant current generator Q₂ and zener diode D₁. The complementary flip-flop operates for one complete cycle with a period (pulse width) proportional to the dc analog input voltage.

Notes:

1. The linearity of this circuit is relatively independent of temperature variations over a range from -20° to 70°C. Its power drain is less than 100 milliwatts.

(continued overleaf)

2. The circuit would be particularly useful as an analog-to-digital converter where low power, ruggedness, reliability, and good linearity are prime requirements.
3. Inquiries concerning this circuit may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland 20771
Reference: B68-10003

Patent status:

No patent action is contemplated by NASA.

Source: W. R. Crockett
(GSFC-556)